16.810 Design and RP
Introduction to idea sketching

What is idea sketching?

Sketching philosophy

Skills drawing basic shapes

Method to represent 3D objects in 2D
Ideation
Sketching
Idea Exploration
Engineering style
Goal
In a few weeks

...in 5-10 minutes
Sketching Philosophy

Technique and visual memory

basic structure  proportion  necessary details
Technique
Rule number 1

no postage stamps
Technique

Rule number 2

no chicken scratches
Sketching Technique
Learning a visual language

Mental Model + Skills + Rules = Communication

cognition
AABBCC
Spelling Grammar
See spot run
Learning Skills (abc)

Freehand arcs
Learning Skills (abc)

Freehand lines
Learning Skills (abc)
Freehand circles
Learning Skills (abc)
Freehand ellipses (30 degree)
Learning The Rules (3D grammar)
Exploring space

"Excuse me for shouting—I thought you were farther away."

Perspective
Learning The Rules (3D grammar)

Perspective

"Perspective is nothing else than seeing a place behind a plane of glass, quite transparent, on the surface of which the object behind the glass are to be drawn".

Leonardo Davinci
Learning The Rules (3D grammar)
Two point perspective

constructing the basic cube
Learning The Rules (grammar)

Position relative to horizon

a refrigerator?
Learning The Rules (3D grammar)

Cylinders
Complex Shapes
From simple shapes
Learning The Rules (2D grammar)

Unambiguously define shape

Orthographic projection
Learning The Rules (2D grammar)

Convention
Orthographic Projection

Lines

Intersection of two surfaces

Edge view of surface

Surface Limit

LEGEND
- Edge view of surface
- Intersection of two surfaces
- Surface Limit
Drawing A Product

Process
Drawing A Product

Step 1: Block out proportions

you may want to create an underlay
Drawing A Product

Step 2: Sketch in the form
Drawing A Product

Step 3: Sketch in the form on an overlay?
Sketching Process

2D or 3D

Block out (position, proportions)
- H pencil

Necessary detail
- H Pencil

Darken in
- fine liner (hidden and low visibility)
- sign pen (interior)
- chisel (exterior)
Exercise
Make a 16.810 underlay

Block out full scale (grid)

Necessary detail (hard points, freedom, forbidden zone)

Darken in
fine liner (freedom)
sign pen (hard points)
chisel (forbidden)